

CLAIMS

1. Process for the production of synthesis gas from a hydrocarbon feed stock comprising the steps of endothermic
5 and/or adiabatic catalytic steam reforming and autothermal steam reforming in series, wherein the steam reforming is carried out in one or more endothermic stages in series and/or in one or more adiabatic steam reforming stages in series with intermediate heating of feed stock gas leaving
10 the adiabatic reforming stages and wherein carbon monoxide containing gas characterised by having a molar ratio of hydrogen to carbon of less than 4.5 is added prior to at least one of the endothermic or adiabatic steam reforming stages and/or prior to the autothermal steam reforming
15 step.
2. Process of claim 1, comprising the further step of adiabatic pre-reforming the feed stock prior to the endothermic or adiabatic steam reforming.
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3. Process of claim 1, wherein the endothermic or adiabatic steam reforming is performed in presence of catalysed hardware.
- 25 4. Process of claim 3, wherein the catalysed hardware is in form of a ceramic monolith or a cross-corrugated ceramic structure.
5. Process of claim 1, wherein the endothermic steam
30 reforming step is performed in heat conducting relationship with a hot process gas.

6. Process of claim 5, wherein the hot process gas is an effluent stream from the autothermal reforming.

7. Process of claim 1, wherein the intermediate heating of the reacting feed stock is performed in heat conducting relation ship with a hot process gas.

8. Process of claim 7, wherein the hot process gas is an effluent stream from the autothermal reforming.

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9. Process according to claim 1,
wherein the carbon monoxide containing gas comprises tail gas from a Fischer-Tropsch process.

15 10. Steam reforming system for use in a process for the production of synthesis gas from a hydrocarbon feed stock comprising
optionally a pre-reformer for adiabatic pre-reforming of the feed stock;
20 a reformer for endothermic catalytic steam reforming and/or at least a first and last adiabatic catalytic steam reformer connected in series;
means for intermediate heating of the feed stock between the at least first and last adiabatic steam reformer;
25 a down stream autothermal steam reformer connected in series with the reformer for endothermic steam reforming or with the last adiabatic steam reformer; and
means for addition of a carbon monoxide containing gas upstream the endothermic steam reformer or upstream of the at
30 least first and/or last adiabatic reformer and/or upstream of the autothermal reformer.